

IN THE CLAIMS:

1 1. (cancelled) A purified and isolated DNA molecule consisting essentially of the  
2 nucleotide sequence set forth in SEQ ID NO:1, or its complementary strand.

1 2. (cancelled) The purified and isolated DNA molecule of Claim 1, wherein said DNA  
2 molecule encodes for a purified and isolated protein molecule consisting essentially of the  
3 amino acid sequence set forth in SEQ ID NO:2.

1 3. (currently amended) A live, attenuated strain of *V.anguillarum* which comprises:  
2 a *mugA* gene comprising nucleotides 1218-2610 of SEQ ID NO:1, ~~the *mugA* gene being~~  
3 ~~mutated such that the strain is incapable of expressing a functional *mugA* protein~~ the strain  
4 having a mutation located within nucleotides 1218-2610 of SEQ ID NO: 1 that renders the  
5 strain incapable of expressing a functional *mugA* protein.

1 4. (original) The live, attenuated strain according to claim 3 wherein the strain is  
2 incapable of growing in salmon intestinal mucus.

1 5. (original) The live, attenuated strain according to claim 3 wherein the mutation is non-  
2 revertible.

1 6. (original) The live, attenuated strain according to claim 4 wherein the mutation is an  
2 insertion.

1 7. (original) The live, attenuated strain according to claim 4 wherein the mutation is a  
2 deletion.

1 8. (currently amended) A vaccine strain against *V.anguillarum* infection in an animal  
2 selected from the group consisting of fish, bivalves and crustaceans comprising:

3 a live, attenuated strain of *V.anguillarum* which comprises a *mugA* gene comprising  
4 nucleotides 1218-2610 of SEQ ID NO:1, ~~the *mugA* gene being mutated such that the strain is~~  
5 ~~incapable of expressing a functional *mugA* protein~~ the strain having a mutation located within  
6 nucleotides 1218-2610 of SEQ ID NO: 1 that renders the strain incapable of expressing a  
7 functional *mugA* protein.

1 9. (original) The vaccine strain according to claim 8 wherein the strain further comprises  
2 a pharmaceutically acceptable carrier.

1 10. (cancelled) The vaccine strain according to claim 8 wherein the animal is a fish.

1 11. (cancelled) The vaccine strain according to claim 8 wherein the animal is a bivalve.

1 12. (cancelled) The vaccine strain according to claim 8 wherein the animal is a crustacean.

1 13. (original) The vaccine strain according to claim 8 wherein the mutation is non-  
2 revertible.

1 14. (original) The vaccine strain according to claim 13 wherein the mutation is an  
2 insertion.

1 15. (original) The vaccine strain according to claim 13 wherein the mutation is a deletion.

1 16. (currently amended) A method for immunizing an animal selected from the group  
2 consisting of fish, bivalves and crustaceans against *V. anguillarum* infection in the animal  
3 which comprises:

4 administering to the animal a vaccine comprised of a live, attenuated strain of  
5 *V.anguillarum* which comprises a ~~mutated~~ *mugA* gene comprising nucleotides 1218-2610 of  
6 SEQ ID NO:1, ~~the *mugA* gene being mutated such that the strain is incapable of expressing a~~  
7 ~~functional *mugA* protein.~~ said strain having a mutation located within nucleotides 1218-2610 of  
8 SEQ ID NO: 1 that renders the strain incapable of expressing a functional *mugA* protein.  
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1 17. (original) The method according to claim 16 wherein administering comprises  
2 immersion.

1 18. (original) The method according to claim 16 wherein administering comprises  
2 intraperitoneal injection.

1 19. (original) The method according to claim 16 wherein administering comprises oral  
2 intubation.

1 20. (original) The method according to claim 16 wherein administering comprises anal  
2 intubation.

1 21. (original) The method according to claim 16 wherein administering comprising  
2 immersing the animal in a medium containing the attenuated strain.

1 22. (canceled) The method according to claim 16 wherein the animal is a fish.

1 23. (canceled) The method according to claim 16 wherein the animal is a bivalve.

1 24. (cancelled) The method according to claim 16 wherein the animal is a crustacean.

1 25. (original) The method according to claim 16 wherein the mutation in the *mugA* gene is  
2 non-revertible.

1 26. (original) The method according to claim 25 wherein the mutation in the *mugA* gene is  
2 an insertion.

1 27. (original) The method according to claim 25 wherein the mutation in the *mugA* gene is  
2 a deletion.

1 28. (currently amended) A method of inducing an immune response in an animal selected  
2 from the group consisting of fish, bivalves and crustaceans against one or more pathogens  
3 which comprises transforming a live, attenuated strain of *V. anguillarum* which comprises a  
4 *mugA* gene comprising nucleotides 1218-2610 of SEQ ID NO:1, said strain having a mutation  
5 located within nucleotides 1218-2610 of SEQ ID NO: 1 that renders said strain incapable of  
6 expressing a functional *mugA* protein the *mugA* gene being mutated such that the strain is  
7 incapable of expressing a functional *mugA* protein., with a plasmid comprising DNA of  
8 interest encoding at least one protein antigen for each of the pathogens and administering the  
9 transformed strain to the animal.

1 29. (cancelled) A method for the detection of the presence of *V. anguillarum* in animal  
2 tissue or fluids comprising:

3 contacting the sample with a detectably labeled DNA probe wherein the probe  
4 comprises a detectable single-stranded DNA having a nucleotide sequence which specifically  
5 and selectively hybridizes with DNA of *V. anguillarum*, the DNA probe comprising a  
6 nucleotide sequence selected from the group consisting of SEQ ID NO. 1, whereby the  
7 presence of the DNA is indicative of a *V. anguillarum* infection.

1 30. (cancelled) A mutated strain of *V.anguillarum* characterized in that the strain is  
2 incapable of growing in salmon intestinal mucous.